Department of Defense
Defense Manpower Data Center
Office of the Under Secretary of Defense (Personnel and Readiness)

DoD ID Card Bar Codes
&
Software Development Kit

Common Access Card, DBIDS ID Card,
& Uniformed Services Identification Cards, Neo Tracking System

Version 7.5.0

Prepared by:
CAC Test Lab, Identity Services Division

Developers of new applications using the bar code technologies should note the following. The barcode technologies on the CACs are considered migration technologies placed on the CAC to continue support of applications until all the CACs have transitioned to smartcard technology.

Record of Changes

This section will be used to maintain version control for the Common Access Card & Uniformed Services Identification Cards Bar Code Software Development Kit, Volume I, Data Formats and Content. As changes are suggested and implemented, they will be reflected in chronological fashion.

Version	Date	Revision Summary
1.0	1 April 1994	Uniformed Services ID cards
2.0	27 April 1997	Civilian ID cards
4.0	4 December 2000	CAC (Draft)
5.0	22 March 2001	CAC
5.1	Final as of 17 December 2001	Corrected CAC Code 39 layout. Documentation only. Corrects the diagrams for the Common Access Card (CAC) Code 39 bar code to show the Person Designator Type Code appearing immediately after the Person Designator Identifier. The DoD EDI Person Identifier (EDIPI), Personnel Category, and Branch Code are shifted one position to the right. Version 5.1a adds an announcement that the bar codes will be dropped from the CAC after FY2007.
5.1a	4 November 2002	Documentation change only. Expected bar code removal date.
6.0	Final as of 17 July 2003	Major changes in non-CAC (Teslin) Code 39 bar codes. Changes Code 39 bar code formats and contents for all Teslin identification cards. The CAC format has been adopted for all sponsor cards (retirees, Standby and IRR Reservists and ING Guard members, special category sponsors, and surviving spouses). All sponsor cards are identified by Bar Code Version Code (1st position) of "1". Both cardholder and sponsor SSNs on dependent cards have been replaced with EDIPI. This new format is identified by Bar Code Version Code (1st position) of "4". Note that this is a reuse of the code used on cards no longer in circulation.
6.1	28 July 2003 Final as of 7 August 2003	Extend and correct lists of Member and Personnel Category codes and card types issued.
6.1a	Draft as of 16 December 2003	Documentation change only. Expected bar code removal date changed. Approval pending.
6.2	21 June 2004 Final as of 2 September 2004	Add middle initial to end of CAC PDF417. See Section 2.2. Add additional Personnel Categories to Table 1.
7.0	30 May 2008	Add DBIDS ID Cards Bar Code format
7.2.3	5 February 2010	Updated section 1.7 to include range for CII. Removed field "Cardholder SSN" in Table 9. Corrected EDIPI range in Table 6 reference 3. Changed Table 12 from Sponsor to Dependent. Corrected length of bar code in Table 13. Corrected reference for Figure 6 Number 2 "RFU". Removed section 5.1 DBIDS 3.0 code 39 and section 5.3 FASC-N Implementation. Out of scope for the current document. Added code examples in Figures 10 and 12. Corrected equation in Appendix B.1.

		Corrected fields in section 5.2 DBIDS 2.0 for PDF417. Updated List of Tables in Appendix C and D.
7.2.4	14 March 2011	Updated DBIDS barcode version references.
7.3.0	July 6, 2011	Updated DBIDS NextGen 4.x barcode data model
7.4.0	December 8, 2011	Added section 1.8 on SSN reduction
7.4.1	May 22, 2011	Corrected DBIDS barcode formats. Updated date and code samples. Updated EDIPI range to reflect requirement that the left most digit must be non-zero.
7.5.0	September 19, 2012	Updated section 1.5

Table of Contents

List of Figures

List of Tables

This page intentionally left blank

1 Introduction

The purpose of this document is to describe the content and formats of the bar codes printed on identification cards used by the uniformed services, DoD civilian employees, and contractors. Developer information on support libraries that can aid in reading and extracting data from bar code formats is also provided. The target populations receiving cards are listed in Table 1 along with various characteristics to help the developer identify which cards are relevant to their application. The bar code information in this document is organized into five sections and four appendices. The organization of this document begins with administrative and general bar information followed by four classes of ID card: Common Access Card (CAC), Uniformed Services Identification (USID), Defense Department Civilian Identification Cards (Forms 27xx), and Defense Biometric Identification System cards (DBIDS). The appendices contain an application data sheet and information on the content of the various fields within the bar codes. USID and Defense Department Civilian ID material has been unchanged from those distributed over the last several years with the exception of data element names.

1.1 Important Contact Information

In order to assure that developers are kept up to date on any changes that might occur in bar code format or content, DMDC keeps a database of persons to whom this documentation is distributed. Consequently, anyone obtaining this document from any source other than a formal transmission from DMDC should register at the CAC support website:

(http://www.dmdc.osd.mil/smartcard/)

or complete the supplemental application data sheet contained in Appendix A and forward to:

Defense Manpower Data Center
barcodesupport@osd.pentagon.mil

To better serve the user community, we encourage you to use the website or e-mail address to keep contact information up-to-date. New developers are encouraged to contact listed developers to obtain advice and relevant software. In many cases, the only contact with the DMDC office occurs prior to the final decision to develop a system and the nature or extent of implementation cannot be supported. Furthermore, the original contact from the developer's organization often leaves and we have difficulty tracking down a replacement.

To request sample test cards — cacsupport@osd.pentagon.mil

For questions on Smart Card Technology — cac.lab@osd.pentagon.mil

Table 1 Populations Receiving CACs and ID Cards

Personnel Category	CAC	Legacy Teslin

(Personnel/Member Category Codes)	(MC – Microchip)	Card (Form)[1]
Active (A)	MC	2ACT
Academy student - does not include Officer Candidate School (J)	MC	2ACT
Reserve (Selected) - mobilized or on active duty for 31 days or more (V/S)	MC	2ACT
Reserve (Standby/IRR) – mobilized or on active duty for 31 days or more (V/S)	MC	2ACT
Reserve (Selected) - not on active duty or on active duty for 30 days or less (V)	MC	2RES
Reserve (Standby/IRR) - not on active duty or on active duty for 30 days or less (V)		2RES
National Guard (Selected) – mobilized or on active duty for 31 days or more (N/G)	MC	2ACT
National Guard (ING) – mobilized or on active duty for 31 days or more (N/G)	MC	2ACT
National Guard (Selected) - not on active duty or on active duty for 30 days or less (N)	MC	2RES
National Guard (ING) - not on active duty or on active duty for 30 days or less (N)		2RES
Presidential Appointee (B)	MC	2750/2764
DoD civil service (C)	MC	2765/2764/2750
DoD Non-appropriated Fund Employee (K)	MC	2765/2764
Other Government Agency (non-DoD) - Civil Service (I)	MC	2765/2764
Lighthouse service (L)		2765
Non-government agency (NGA) - American Red Cross, et al (M)		2765
Academy Student (J)	MC	
Service Affiliate – ROTC, Merchant Marine Academy, volunteers (Y)	MC	2765
DoD contractor – designated (E)	MC	2765/2764
[1.] Grayed entries identify form number of cards being replaced by CAC, or other card type.		
Other Government Agency (non-DoD) – Contractor (O)	MC[2]	2765/2764
Foreign military (T)	MC	1173

Foreign national employee (U)	MC	1173
Retired (R)		2RET
Reserve retiree (Q)		2RESRET
100% disabled American veteran (D)		2765
Former member - a 20-year active-duty serviceman who was eligible to retire but elected discharge (F)		2765
Transitional Assistance Management Program (F)		2765
DoD Beneficiary – person receiving benefits based on prior authorization (W)		2765
Medal of Honor (H)		2765
Dependents – except children under 10		1173/1173-1
Dependents – designated children under 10		1173/1173-1
Surviving and former spouses - DoD Beneficiary (W)		2765/1173
Emergency cards issued off-line to above (All CAC eligible)	No MC	All

[1.] Grayed entries identify form number of cards being replaced by CAC, or other card type.
[2.] Receive CAC if logical access is required; may receive CAC for electronic physical access; otherwise, receive 2765 or 2764

1.2 Note on Legacy Technologies and Migration

The bar codes, especially the PDF417 bar code, are being placed on the CAC primarily to provide some degree of backward compatibility support to existing bar code applications. It is anticipated that the bar code user community will migrate their bar code applications to the new smart card technology, coincident with the life cycle of the existing infrastructure and a business analysis of the application. Factors that are likely to affect individual migration decisions are:

- Expanding application requirements to use the greater amount of data available on the microchip.
- Expanding application requirements to write data to the card to support the application at different locations or to support other applications.
- Increasing security requirements to assure positive identification of the cardholder or to protect identity data.
- Increasing data availability and functional capability as microchip technology evolves.
- Availability of smart card reader infrastructure.
- Cost comparisons of reader technologies and processes.

Developers wishing to explore migration may obtain information on using the microchip by logging into the Developer support section of the CAC web site:

(http://www.dmdc.osd.mil/smartcard/).

1.3 Target Populations

Populations targeted for the CAC, existing cardholders, and card applicability are summarized in Table 1. It should be noted that an individual may have dual status (e.g., DoD employee and Reservist, Retiree and dependent, etc.) and hold more than one card. If an application merely uses the generic identifier data and not status data to access a database or construct an attendee list, any one of the individual's cards are likely to supply the necessary data. On the other hand, if status or affiliation data is required the application developer should assume that the individual will present the card that is appropriate to the role that brings the person in contact with the application.

With the exception of Personnel who do not regularly require an electronic card to gain physical access to controlled areas or logical access to Government computers, all the members of a target population will be issued at least one Common Access Card (CAC):

- All Active Duty members.
- All Selected Reserve and National Guard members including those on active duty.
- Reserve and National Guard members who are not in selected components but on active duty .
- Most civilian DoD employees, including non-appropriated fund (NAF), presidential appointees, and foreign national employees.

- Foreign military obtain cards following the same rules as those for foreign national DoD employees.
- Designated DoD contractors who require an electronic card to gain physical access to controlled areas or logical access to Government computers.
- Non-DOD Federal and state Agency Employees that require logical access to DoD computers.

Descriptions of bar codes for the CAC are shown in Section 2.

Migration of the target populations to the CAC is currently mandated for completion by the 30th of September 2003. However some of the legacy cards may still be circulating several months into the following year. Active duty and reserve members(groups a and b) and civilian employees and contractors (c and d) who are serving overseas or are classified as emergency essential will continue to use their legacy Teslin Uniformed Services identification and privilege cards without microchips until replaced by a CAC. Foreign military who are assigned to U.S. units and are issued CACs to access locally authorized DoD benefits, will also continue to use their legacy cards until replaced. Upon completion of migration, all DD Forms 2 (Active), 2750, and 2764 will disappear from circulation.

The following populations will continue to receive the Teslin Uniformed Services identification and privilege cards, which contain no microchips, as indicated, without exception:

- Reserve members who are in the Standby Reserve, Individual Ready Reserve, or the Inactive National Guard, i.e., components that are not classified as of Selected Reserve, receive a DD Form 2 (Reserve).
- Retirees with full retirement benefits receive a DD Form 2 (Retired).
- Reserve retirees receive a DD Form 2 (Reserve Retired) until they reach age 60, at which time they qualify for full retirement benefits.
- Former Service members who are eligible for some benefits, but not retiree benefits, and several designated non-DoD Government employees who are eligible for some benefits receive DD Form 2765.
- Dependents of active duty, reserve, and retired (with full retirement benefits) members receive a DD Form 1173 or 1173-1. While there are some exceptions, generally children below the age of 10 do not receive any cards.

Descriptions of bar codes for these Teslin cards are shown in Sections 3 & 4.

In emergency situations when the issuing station cannot connect to needed databases and servers, CACs may be issued in off-line mode. These cards look identical to normal CACs, but contain no microchip. These cards are designed primarily to meet “flash pass” requirements. The bar code formats are identical to regular CACs but some fields are blank.

Active duty and reserve categories refer to the seven United States’ Uniformed Services – Army, Navy, Marine Corps, Air Force, Coast Guard, Commissioned Corps of the United States Public Health Service (USPHS), and Commissioned Corps of the National Ocean and Atmospheric Administration (NOAA). Detailed guidance on eligibility for specific cards is provided in the DoD and Service directives:

- DoD instruction 1000.13, "Uniformed Services' Identification (ID) Cards, as amended by OSD policy memo, Common Access Card (CAC), 18 April 2002.
- DoD Instruction 1000.1, "Identity Cards Required by the Geneva Conventions"
- DoD Instruction 1000.23, "Department of Defense Civilian identification (ID) Cards"
- Joint Service Publication AFI 36-3026, "ID Cards for Members of the Uniformed Services, Their Eligible Family Members, and Other Eligible Personnel."
- DoD Directive 8190.3, "Smart Card Technology," August 30, 2002.

Local conditions and authorities may dictate exceptions to the basic guidelines.

1.4 Standards

All cards contain a standard Code 39 linear bar code and a standard two-dimensional PDF417 bar code. The Code 39 standard is defined in ISO/IEC 16388, Information technology -- Automatic identification and data capture techniques -- Bar code symbology specifications—Code 39. The PDF417 is defined in ISO/IEC 15438, Information technology -- Automatic identification and data capture techniques -- Bar code symbology specifications -- PDF417. Both bar codes have been approved as DoD standards. Because both bar codes on all cards encode data at a very high density, high quality printing and bar code reader selection is important.

While compression is used in both bar codes to reduce the length of some data elements, no encryption is employed. The Person Identifier (typically Social Security Number - SSN) is reduced from 9 to 6 characters using a simple arithmetic translation from the decimal (Base 10) system to a Base 32 system. The ten-digit decimal identifier, DoD Electronic Data Interchange Person Identifier (EDIPI), is compressed to 7 characters using the Base 32 system. Several dates are compressed by using a Base 32 representation of the count of the days from a base date. More details on date compression are provided in the sections describing the bar codes. The decompression algorithm is described in Appendix C.

The photograph stored in the PDF417 of Teslin cards is in the Joint Photographic Experts Group (JPEG) format as defined in ISO/IEC 15444-1, Information technology -- JPEG 2000 image coding system -- Part 1: Core coding system.

Formats for bar codes and the JPEG image are in the public domain and require no licensing.

1.5 Summary of Bar Code Changes

The format and content of the PDF417 bar codes on both the CAC and legacy Teslin cards will remain as they have been for the last few years. Information for these formats is provided in Sections 3 & 4.

The Code 39 changes for the all the Teslin cards include a reduction in overall length, as well as internal changes. The overall length has been reduced from the current 21 characters to 18. This has been accomplished by reducing the Card Security Code from 4 characters to a 1-character Card Instance Identifier.

For sponsor cards, the Person Designator Identifier, which normally contains SSN, remains in positions 2 through 7 and continues to be stored using the Base 32 compression algorithm instituted in 1992. Following the Person Designator Identifier field is a single character field identified as Person Designator Type Code. This field, coded "S" for SSN, identifies the type of number stored in the preceding field. Rank and Status have been dropped and the space used for the new ten-digit EDIPI, compressed to 7 characters.

As of 2001, the cardholder's and sponsor's Person Designator Identifier/SSN fields have been dropped from dependent cards. These fields have been replaced by the cardholder's and sponsor's 10-digit EDIPIs compressed to 7 characters each.

There are also changes in content and format of the affiliation information. The Member Category and Service/Component Codes, which define the member/sponsor's Branch, component (active/Reserve/Guard), and active duty status, have been reformulated to comply with DoD data standardization objectives and to provide more clarity in defining sponsor `groups and status. Branch Code and Personnel Category Code now provide essentially the same information. Member Category has been replaced by Personnel Category Code which has the same set of codes except Personnel Category Code does not distinguish between Guard/Reserve members who are on active duty and those that are not.

Issues pertaining to transition from Card Security Code to the Card Instance Identifier are discussed in the Card Security section.

Please see section 1.5 on regarding removal of SSN number from the barcode 39 code.

1.6 Bar Code Readers and Software

The CAC and ID card bar codes are standard and can be read by most commercially available readers. One-dimensional linear bar code readers can read only the Code 39. The two dimensional (2-D) bar code readers can read both the Code 39 and PDF417 bar codes. Readers can be obtained through a number of sources. The best prices are probably available through local procurement offices using the Government-wide Automatic Identification Technology (AIT) contract:

(http://www.peostamis.belvoir.army.mil/ait/home.htm)

The DoD AIT (http://www.dodait.com) site also has product information and links to Service AIT office web sites. Slot and gun-type Code 39 reader suppliers can be found easily by searching the Internet. PDF417 readers are available from a number of manufacturers and various catalog vendors.

Code 39 readers come in two configurations – keyboard wedge and serial (COM) port connection. The keyboard wedge works well with the Code 39 and requires no special treatment to access the serial port. Data appears exactly as it is typed in. This type of connection only works if the input stream is a pure ASCII stream and the total length of the input stream is less than the size of the keyboard buffer. Since the older PDF417 contains binary, non-ASCII data and the newer PDF417 is still over 80 characters, it must be connected to the serial port. Readers connected to the serial port require some computer code to activate and control the port and the data transfer. The code can use the communications Active-X control (MSCOMM.OCX) to simplify access to the port functions, or can access the port functions directly through the Windows Application Programming Interface (API). The DEERS/RAPIDS Program Office (DRPO) provides a set of libraries (DLLs) that implement a simplified API to the reader and for obtaining data elements without regard to the card type or version. This API is described in Volume II.

While the PIPS and the DEERS/RAPIDS Program Office (DRPO) do not develop any bar code applications, they do make some sample software available to serve as code models for using DMDC provided software to extract the bar code content. The sample code in these examples is often useful for pasting into user-developed application software. Samples, which are available on request, include C/C++, Visual Basic, and Microsoft Access versions. Developers of applications using the serial port model readers, as opposed to keyboard wedge readers, should find the examples especially helpful. Because of the several PDF417 formats in use, the sample code is valuable. Developers are also encouraged to contact other developers who have already implemented similar applications.

1.7 Card Security

The Card Instance Identifier (CII), formerly the Card Security Code, found in both the Code 39 and the PDF417 bar codes, provides a way to distinguish between two cards issued to a single individual. The CII field is one byte and can be any alphanumeric character in the range of 0 to 9 or A to Z, 36 possible characters in total. The primary purpose for this mechanism is to recognize when a lost or stolen card is being illegally used to attempt entry into a restricted area or to obtain benefits. Each time a card is issued, a new number is generated. This number is generated randomly, rather than sequentially, in order to provide some additional protection against counterfeiters.

Access control systems which register the Card Instance Identifier can intercept attempts to use lost or stolen cards for entry; however, this only works if the legitimate cardholder either notifies the system administrator to invalidate the card, or gets a new card and registers it with the system. One of the drawbacks of the Card Instance Identifier is the need to re-register every time an individual is issued a new card. There are a number of approaches that a system developer can take to implement security, some of which have unwelcome consequences. The simplest approach is to prevent entry if the Card Instance Identifiers do not match. More aggressive actions are to alert security personnel or lock the account when a card is suspected to be counterfeit. Sounding an alert may unnecessarily involve security personnel if a cardholder got a new card and neglected to re-register, a likely situation. A lock on the person's account would cause inconvenience to the cardholder by locking him or her during subsequent attempts to enter. The system could implement an alert by holding previous Card Instance Identifiers to use as a revocation list.

Because of the need to adopt the shorter Card Instance Identifier, vulnerability to counterfeiters has been increased. With the 4-character Card Security Code, a counterfeiter might have to generate and try thousands of versions of the bar code for an individual in order to find the correct one for entry. With the single character Card Instance Identifier, the counterfeiter only needs to generate 36 dummy cards with bar codes to make sure that one will work. While thousands of possibilities most likely deter the individual from even attempting illegitimate entry, the counterfeiter may find that only 36 possibilities is worth trying, especially if he has time to spread the attempts over some period of time. The system might counter this threat by establishing a threshold triggered by a count of match failures over time. Match failures interspersed with legitimate entries would clearly signal that someone was trying to use a superseded card.

1.8 SSN Reduction

As part of the Department's Social Security Number (SSN) reduction activity (i.e., Under Secretary of Defense for Personnel and Readiness Memorandum, "Updated Plan for the Removal of Social Security Numbers (SSNs) from Department of Defense (DoD) Identification (ID) Cards," 5 November 2010), DoD will remove the SSN from barcodes that are printed on the Common Access Card (CAC) and the remaining family of DoD identification cards. The DoD has completed phase I of the transition by removing the clear text field containing the SSN printed on the surface. The next phase will remove the SSN from the Code 39 barcodes.

DMDC considered completely removing the SSN field from the structure of the Code 39 barcodes and realigning the remaining fields, however, discarded this approach due to the extensive impact that it would have on all applications that read and interpret the individual fields. DMDC decided that the best approach (i.e. least impact) for removing the SSN is to keep the current structure and repurpose the field. The SSN field will become a unique card identifier that distinguishes each card from any other card issued to an individual. The new field format will allow Physical Access Control Systems (PACS) that keep a history of an individual's enrolled cards, such as the Defense Biometrics Identification System (DBIDS), to distinguish all previously issued cards from the current card.

The Social Security Administration does not issue valid SSNs that begin with "999". DMDC plans to set the card identifier's leading three digits to nines to serve as a flag for an invalid SSN number since the Social Security Administration does not issue valid SSNs that begin with "999". The remaining six digits provide 1,000,000 (10^6) unique numbers to identify cards issued to each individual. The SSN field in the Code 39 barcode will continue to be encoded as six base-32 characters.

SSN Format: 999-XX-XXXX
Example: 999-55-1212 (base-10)→ TP7S7C (base-32)

Applications using that use the SSN within the barcode should already be aware of the migration to EDIPI (instead of the SSN) within the DoD to using the EDIPI (instead of the SSN) as the unique identifier for individuals within the DoD. System maintainers will be required to modify their systems to use the EDIPI instead of the SSN.

2 Common Access Card Bar Code Formats

The bar codes on the Common Access Card (CAC) are the same for all currently targeted populations:

- Active Duty members.
- Selected Reserve and National Guard members. This includes Selected Reserve and Guard members who are on active duty.
- Civilian DoD employees, including non-appropriated fund (NAF) and foreign national employees.
- DoD contractors requiring electronic access to physical areas or government computers.
- Foreign military assigned to U.S Forces.

See Section 1 for more details on target populations and information to help decide whether your application should also handle the legacy Teslin ID cards still in circulation.

Each card issued to an individual is uniquely identified by a 1-character Card Instance Identifier. The Card Instance Identifier from the most current card is stored in the DEERS database. This code is changed at each re-issuance and can be used to detect fraudulent use of lost or stolen cards. Applications using this code to detect fraudulent use of cards will require personnel to re-register in their local system each time they obtain a new card. Further discussion of the purpose of the Card Instance Identifier and its uses is provided in Section 1.4.

2.1 Code 39

The CAC Code 39 bar code layout contains seven data elements. The layout follows the existing layout for civilian ID cards as much as possible. Formats and field descriptions are shown in Figure 1 and Table 2, respectively. Current codes for most of the fields are listed in Appendix C. Developers are encouraged to check the Web site for up-to-date code lists. Instructions for decompressing the Person Designator Identifier and DoD EDI Person Identifier fields are provided in Appendix C.

Figure 1 CAC Code 39 Bar Code Format

VC[1]	Person Designator Identifier (SSN, etc.)[2]						PT[3]	DoD EDI Person Identifier[2]							PC[4]	BC[5]	CI[6]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1. VC = Bar Code Version Code
2. Identifiers are compressed
3. PT =Person Designator Type Code
4. PC = Personnel Category Code
5. BC = Branch Code
6. CI = Card Instance Identifier

Table 2 CAC Code 39 Bar Code Detail

Field	Length	Description
Bar Code Version Code	1	"1" - Indicates format version and card type for the bar code
Person Designator Identifier (PDI)	6	Base 32[7] coding of the cardholder's or sponsor's identifier (usually SSN).
Person Designator Type Code	1	See Appendix C.
DoD EDI Person Identifier (EDIPI)	7	Base 32[8] coding of a DEERS-assigned numeric 10-digit numeric identifier.
Personnel Category	1	See Appendix C.
Branch Code (Service)	1	See Appendix C.
Card Instance Identifier	1	Machine-generated random code used for security purposes to distinguish the card from other cards issued to the same cardholder. Formerly, Security Code.
Total Characters	**18**	

7. The nine-digit SSN in the range 000-00-0000 to 999-99-9999 is stored as a six-digit base 32 number in the corresponding range 000000 to TPLIFV.
8. The ten-digit EDIPI in the range 10000-00000 to 99999-99999 is stored as a seven-digit base 32 number in the corresponding range 0TPLIG0 to 9A0NOVV.

2.2 PDF417

Currently, there are two versions of the PDF417 in circulation. The current contains seventeen data elements which differ from the original version by including the cardholder's middle initial. The two versions of the formats and brief descriptions of the contents are shown in Table 3 and Table 4, respectively. Current codes for most of the fields are listed in Appendix C. Developers are encouraged to check the CAC Web site for up-to-date code lists. See Appendices E and F, DODI 1000.13 and Service implementing directives, and the DEERS Data Dictionary for more information on coding and data derivation... The Person Designator Identifier, DoD EDI Person identifier, and 3 date fields are compressed. Instructions for decompressing these fields and factors for converting the date fields to common date formats are provided in Appendix C.

Table 3 CAC PDF417 Bar Code

Field	Size	Description
Bar Code Version Code	1	"1" - Indicates bar code format version and card type.
Person Designator Identifier (PDI)	6	Usually, the cardholder's SSN (compressed). The nine-digit PDI in the range 000-00-0000 to 999-99-9999 is stored as a six-digit base 32 number in the corresponding range 000000 to TPLIFV.
Person Designator Type Code	1	See Appendix C.
DoD EDI Person Identifier (EDIPI)	7	DEERS-assigned numeric identifier (compressed). The ten-digit EDIPI in the range 1000000000 to 9999999999 is stored as a seven-digit base 32 number in the corresponding range 0TPLIG0 to 9A0NOVV.
Person First Name	20	
Person Surname	26	Last name.
Date of Birth	4	Number of days from 1 January 1000 (compressed).
Personnel Category Code	1	See Appendix C.
Branch Code (Service)	1	See Appendix C.
Personnel Entitlement Condition Type	2	See Appendix C.
Rank	6	See DODI 1000.13. (TSGT, MAJ, etc.)
Pay Plan Code	2	See Appendix C.
Pay Plan Grade Code	2	See Appendix C.
Card Issue Date	4	Number of days from 1 January 1000 (compressed).
Card Expiration Date	4	Number of days from 1 January 1000 (compressed).
Card Instance Identifier	1	A machine-generated random code that is used for security purposes to distinguish a card from other cards that have been issued to a cardholder. Formerly, Security Code.
Total Characters	**88**	

Table 4 CAC PDF417 Bar Code

Field	Size	Description
Bar Code Version Code	1	"N" - Indicates bar code format version and card type.
Person Designator Identifier (PDI)	6	Usually, the cardholder's SSN (compressed). The nine-digit PDI in the range 000-00-0000 to 999-99-9999 is stored as a six-digit base 32 number in the corresponding range 000000 to TPLIFV.
Person Designator Type Code	1	See Appendix C.
DoD EDI Person Identifier (EDIPI)	7	DEERS-assigned numeric identifier (compressed). The ten-digit EDIPI in the range 1000000000 to 9999999999 is stored as a seven-digit base 32 number in the corresponding range 0TPLIG0 to 9A0NOVV.
Person First Name	20	
Person Middle Initial	n/a	See end of format.
Person Surname	26	Last name.
Date of Birth	4	Number of days from 1 January 1000 (compressed).
Personnel Category Code	1	See Appendix C.
Branch Code (Service)	1	See Appendix C.
Personnel Entitlement Condition Type	2	See Appendix C.
Rank	6	See DODI 1000.13. (TSGT, MAJ, etc.)
Pay Plan Code	2	See Appendix C.
Pay Plan Grade Code	2	See Appendix C.
Card Issue Date	4	Number of days from 1 January 1000 (compressed).
Card Expiration Date	4	Number of days from 1 January 1000 (compressed).
Card Instance Identifier	1	A machine-generated random code that is used for security purposes to distinguish a card from other cards that have been issued to a cardholder. Formerly, Security Code.
Person Middle Initial	1	
Total Characters	**89**	

3 Uniformed Services Identification Card Bar Code Formats

The Uniformed Services Identification (USID) Cards can be found as four computer-produced DoD forms:

- DD Form 2 (Active, Retired, Reserve, and Reserve/Retired)
- DD Form 1173 and DD Form 1173-1, for a sponsor (Sponsor DD Forms 1173 are being phased out by DoD civilian ID cards -- DD Forms 2764 and 2765 (see Section 4.)
- DD Form 1173 and DD Form 1173-1, for dependents who have their own SSN
- DD Form 1173 and DD Form 1173-1, for dependents that do not have or will not provide a SSN.

Applications can determine the specific population from the data in the bar codes as indicated in Table 5.

Several versions of the formats have been produced since automated production of the cards began in 1992. With a few exceptions, developers should continue to program for all the formats described in this section. While some card types and formats are no longer produced, the older versions will remain in circulation for some time to come. Card life cycles vary with the population. Cards for persons serving on active duty or in the reserve forces are routinely replaced upon promotion (E4, and above) or reenlistment, family member cards are replaced at least every four years, and retiree cards are indefinite or are replaced at age sixty-five. Additional information on the likelihood of encountering specific versions is provided in the following.

Table 5 Identifying Populations from USID Cards

Code 39	PDF417		Definition
Bar Code Version (24/21/18)[1]	Form Number	Sponsor Flag	
13[2]/A/1[3]	2ACT[4]	1	DD Form 2 (Active)
2/B/1[3]	2RET[4]	1	DD Form 2 (Retired)
3/C/1[3]	2RES[4]	1	DD Form 2 (Reserve)
4[5,6] /D/1[3]	1173	1	DD Form 1173 for sponsor
5[5]/E/4[3]	1173	0	DD Form 1173 for dependent
6[5]/F/4[7]	1173(1173-1)[4]	0	DD Form 1173-1 for dependent
7[5]/G/4[7]	1173	0	DD Form 1173 without dependent SSN
8[5]/H/4[7]	1173(1173-1)[4]	0	DD Form 1173-1 without dependent SSN
9/I/1[3] J/1[3]	2RRT 1173(1173-1)[4]	1 1	DD Form 2 (Reserve Retired) DD Form 1173-1 (Reserve Retired – TA)

1. First numeric Bar Code Version Codes are for 24-character Code 39 bar codes; middle alphabetic codes are for 21-character Code 39 bar codes; numeric ("1" and "4") codes at end are for 18-character Code 39 bar codes.
2. Code 39 Bar Code Version Code "1" has been reused for the CAC and 18-character sponsor card Code 39 Bar Code Version Code. See Note 6.
3. Numeric Bar Code Version Code of "1" reflects reuse of that code.
4. Form number is four characters in Bar Code Versions 1 and 2. In other versions, it is six characters, left-justified, and includes the values enclosed in parentheses.
5. Cards with 24-character bar code that are no longer in circulation.
6. Code 39 Bar Code Version Code "4" has been reused for the 18-character dependent card Code 39 Bar Code Version Code. See Note 7.
7. Numeric Bar Code Version Code of "4" reflects reuse of that code.

3.1 Code 39

The Code 39 bar code on the USID cards has evolved over time into the three versions that currently exist. The version currently issued is 18 characters and aligns with the CAC bar code. The original version contained 24 characters and will not read in a slot reader unless held so that they are not touching the bottom of the slot during the swipe. Three unused columns were removed from the 24-character version to provide the third version, a 21-character symbol. The 21-character bar code was also moved further away from the edge of the card to assure better alignment with slot readers. The 21-character symbol was further shortened to align it with the 18-character CAC bar code which was shortened to accommodate the lower resolution plastic card printers.

Cards in the 24-character Code 39 format were produced at a few sites for a few months during 1993-94. All family member cards (Version Codes 5-8) and sponsor 1173 cards (Version Code 4) have expired by now. It is unlikely that any Active Duty Form 2/2RES cards (Version Codes 1 & 2) are still circulating; however, a few may still exist. Bar Code Version Code "1" is now being reused for the CAC. If the developer wishes to program for the older version or make sure that there is no confusion between it and the CAC, the application should check the length of the bar code read. The legacy card length is 24 characters and CAC length is 18 characters. If any 24-character retiree cards are still in circulation, they probably number less than 200.

A listing of the fields in each version of the Code 39 bar code and a brief description of each field are shown in the figures that follow. Layouts for the 24- and 21-character versions are shown in Figure 2 and Figure 3 respectively. Characteristics of the data fields are summarized in Table 6. Descriptions of the codes used in the bar codes and tables showing interaction of the codes are provided in Appendices D and E. See DODI 1000.13, Service implementing directives, and the DEERS Data Dictionary for more information on coding and data derivation.

The Person Designator Identifier and Card Issue Date are compressed. Issue Date represents the number of days from a base date of 1 January 1980. Instructions for decompressing these fields and translating the date field are provided in Appendix C.

Each USID Card that has been issued to an individual is uniquely identified by a 4-character Card Security Code (re-designated the 1-character Card Instance Identifier on the CAC). The Card Security Code from the most current card is stored in the DEERS database. This code is changed at each re-issuance and can be used to detect fraudulent use of lost or stolen cards. Applications using this code to detect fraudulent use of cards will require personnel to re-register in their local system each time they obtain a new card.

The remainder of this discussion applies only to family member cards, and specifically only to Bar Code Versions G & H. In some cases a family member may not have an SSN or may wish to withhold their SSN and not have it put on their identification card. In the absence of an SSN, DEERS generated a unique code, DEERS Dependent Suffix (DDS), to distinguish among members of the same family. This structured code was used in conjunction with the sponsor's Person Designator Identifier (PDI) to access the individual member's DEERS record. A later variation of this code redefined the DEERS Dependent Suffix (DDS) to a new

coding scheme, DMDC Dependent Suffix Code (DDSC). DDS is a structured system with ranges applying to the family role, while DDSC is not structured and codes are sequentially generated as family members are registered in DEERS. Note that, DDS is similar in concept to the medical community's Family Member Prefix (FMP), but is not the same and is generated using a different strategy.

G & H cards are for family members who do not have an SSN or choose not to provide their SSN. Cards encoded with DDS contained a blank in the DDSC Flag field while the flag field in cards containing DDSC contains an "A". Production of DDS cards ceased at the end of 1998. Since then, G & H cards have been discontinued in favor of E and F cards, which are now issued using a DEERS-generated pseudo-SSN in the range of 8xx-xx-xxxx. Applications that were not using family member cards, or DDS or DDSC, were not affected by these changes.

Figure 2 USID Card Code 39 Bar Code Formats (24 characters)

VC[1]	Person Designator Identifier (PDI)						Pay Grade				RFU[2]					SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

1. DD Form 2 Card (Version Codes 1, 2, 3, and 9)

VC[1]	Person Designator Identifier (PDI)						Status						RFU[2]			SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

2. DD Form 1173 Sponsor Card (Version Code 4)

VC[1]	Person Designator Identifier (PDI)						Sponsor's Person Designator Identifier						RFU[2]			SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

3. DD Form 1173 or DD Form 1173-1 Dependent Card with Dependent SSN (Version Codes 5 and 6)

VC[1]	DDS[4]		RFU[2]				Sponsor's Person Designator Identifier						RFU[2]			SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

4. DD Form 1173 or DD Form 1173-1 Dependent Card with No Dependent SSN (Version Codes 7 and 8)

1. VC = Bar Code Version Code
2. RFU = Reserved for Future Use
3. SC = Service/Component Code
4. DDS = DEERS Dependent Suffix

Figure 3 USID Card Code 39 Bar Code Formats (21 characters)

VC[1]	Person Designator Identifier (PDI)						Pay Grade				RFU[2]		SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

1. DD Form 2 Card (Version Codes A, B, C, and I)

VC[1]	Person Designator Identifier (PDI)						Status						SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

2. DD Form 1173 Sponsor Card (Version Codes D and J)

VC[1]	Person Designator Identifier (PDI)						Sponsor's Person Designator Identifier						SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

3. DD Form 1173 or DD Form 1173-1 Dependent Card with Dependent SSN (Version Codes E and F)

VC[1]	DDS/ DDSC[4]		DF[5]	RFU[2]			Sponsor's Person Designator Identifier						SC[3]	Card Issue Date			Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

4. DD Form 1173 or DD Form 1173-1 Dependent Card with No Dependent SSN (Version Codes G and H)

1. VC = Bar Code Version Code
2. RFU = Reserved for Future Use
3. SC = Service/Component Code
4. DDS/DDSC = DEERS Dependent Suffix/DMDC Dependent Suffix Code
5. DF = DDSC Flag

Figure 4 USID Card Code 39 Bar Code Formats (18 characters)

VC[1]	Person Designator Identifier (SSN, etc.)[2]							PT[3]	DoD EDI Person Identifier[2]							PC[4]	BC[5]	CI[6]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

5. DD Form 2 and DD Form 1173 Sponsor Cards (Version Code 1)

VC[1]	DoD EDI Person Identifier (Cardholder)[2]								DoD EDI Person Identifier (Sponsor)[2]							PC[4]	BC[5]	CI[6]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

6. DD Form 1173 or DD Form 1173-1 Dependent Card (Version Code 4)

1. VC = Bar Code Version Code
2. Identifiers are compressed
3. PT =Person Designator Type Code
4. PC = Personnel Category Code
5. BC = Branch Code
6. CI = Card Instance Identifier

Table 6 USID Card Code 39 Field Detail

Field	Length	Description
Bar Code Version Code	1	Indicates bar code format version or card type. See Table 5.
Person Designator Identifier (PDI)	6	Base 32[1] coding of the cardholder's or sponsor's identifier (usually SSN).
Person Designator Type Code	1	See Appendix C.
DoD EDI Person Identifier (EDIPI)	7	Base 32[2] coding of a DEERS-assigned numeric 10-digit numeric identifier.
Personnel Category	1	See Appendix C.
Branch/Service Code (Service)	1	See Appendix C.
Service/Component Code	1	Branch of Service and component. See Appendix C.
DDS/DDSC[3]	2	Digits of the DEERS Dependent Suffix or the DMDC Dependent Suffix Code. See Appendix D.
DDSC Flag[3]	1	Flag used to indicate that the preceding field contains the DDSC rather than the DDS. A blank indicates DDS; "A" indicates DDSC.
Card Issue Date[4]	3	Base 32 coding of number indicating date card was issued.
Pay Grade	4	Pay grade (e.g., O-3, E-4, and W-2). See DODI 1000.13.
Status	6	Text of status. See DODI 1000.13.
RFU	Varies	Reserved for Future Use. These fields are kept blank.
Card Security Code[5]	4	Machine generated four-character code used for card security purposes.
Card Instance Identifier	1	Machine-generated random code used for security purposes to distinguish the card from other cards issued to the same cardholder. Replaces 4-digit Card Security Code.

1. The nine-digit SSN in the range 000-00-0000 to 999-99-9999 is stored as a six-digit base 32 number in the corresponding range 000000 to TPLIFV.
2. The ten-digit EDIPI in the range 1000000000 to 9999999999 is stored as a seven-digit base 32 number in the corresponding range 0TPLIG0 to 9A0NOVV.
3. The DMDC Dependent Suffix Code (DDSC) replaced the DEERS Dependent Suffix (DDS) in 1998.
4. The Card Issue Date field contains a number that represents the number of days from 1 Jan 1980. The decimal number, which ranges from 0 to 32,766, is stored as a 3-digit base 32 number in the corresponding range of 000 to VVT.
5. The first position of the Card Security Code field on cards produced on deployable RAPIDS contains a period (.). Re-designated as 1-character Card Instance Identifier in all 18-character bar codes.

3.2 PDF417

The PDF417 bar code consists of three data segments:

- Header Data.
- Text Data.
- Digital Photograph Data.

3.2.1 Header Data

The header information contains data used to decode the PDF417 bar code. A layout of the PDF417 header record and a description of each field contained in the PDF417 header segment are provided in Table 7 and Table 8, respectively.

Figure 5 PDF417 Header Fields

Identification Code				Vers	PDF417 Size		CkSum	RSize
1	2	3	4	5	6	7	8	9

Table 7 PDF417 Header Field Detail

Field	Size	Description
Identification Code	4	Always contains “IDUS.” This indicates that the bar code being decoded is the PDF417 bar code used by the ID card system.
Vers	1	Version of the PDF417 bar code format.
PDF417 Size	2	Length of PDF417 bar code following this field. This value plus 7 should equal the total length of the bar code read.
CkSum	1	Checksum of the bytes in the bar code.
RSize	1	Indicates the size of the RAPIDS data contained in the PDF417 bar code.

3.2.2 Text Data

Every field printed on the ID card is encoded into the text data portion of the PDF417 bar code. The PDF417 bar code created for a sponsor's card differs from that created for a dependent's ID card. Currently, within each of the two cardholder types, there are three versions of the card in circulation. Version 3 includes two variations that are distinguishable only by the differences in the codes sets. The differences among the PDF417 versions are:

- Version 2 adds a 4-character Pay Grade field after the Rank field on both sponsor and dependent cards.
- Version 3 extends the Form Number field from four to six digits on all card types.
- A second form of Version 3 replaced the 2-digit structured DEERS Dependent Suffix (DDS) with the 2-digit sequentially assigned DMDC Dependent Suffix Code (DDSC). It also extended the coding of the Privilege Flags -- Direct and Civilian Health Care; Commissary; Morale, Welfare, and Recreation (MWR); and Exchange.

Layouts for the sponsor's ID card for versions 1, 2, and 3 are shown in Table 8 through Table 10. Corresponding layouts for the dependent's ID cards are shown in Table 11 through Table 13. See Appendices E and F, DODI 1000.13 and Service implementing directives, and the DEERS Data Dictionary for more information on coding and data derivation. See Section 4 for DoD civilian ID card formats.

3.2.3 Digital Photograph Data

The digital photograph encoded into the last part of the PDF417 is a compressed, resized version of the photograph printed on the front of the card. The photograph is first downsized to a fourth of its captured size and then compressed using the Joint Photographic Expert Group's (JPEG) standardized compression method for gray-scale images. The resulting binary stream is stored in the JPEG File Interchange Format (JFIF). The JPEG compression is considered "lossy," meaning that the output image is not necessarily identical to the input image. Most graphics software (beyond Microsoft Paint and Paintbrush) can read and display the extracted JPEG file when stored with a “jpg” extension. These software packages can also serve as OLE servers to display the photo in application forms.

Table 8 PDF417 Bar Code Format, Sponsor's ID Card, Version 1

Field Version	Size 1	Notes "1" in header
Sponsor Flag	1	"1" – Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix	2	"20"
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	Y=Yes; N=No.
CHAMPUS Flag	1	C=Yes; N=No.
Commissary Flag	1	Y=Yes; N=No.
MWR Flag	1	Y=Yes; N=No.
Exchange Flag	1	Y=Yes; N=No.
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	4	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	See DODI 1000.13.
Geneva Conventions Code	3	See DODI 1000.13.
Blood Type	3	See DODI 1000.13.
Total Characters	140 (excluding Version in header)	

Table 9 PDF417 Bar Code Format, Sponsor's ID Card, Version 2

Field Version	Size 1	Notes "2" in header
Sponsor Flag	1	"1" – Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix	2	"20"
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	Y=Yes; N=No.
CHAMPUS Flag	1	C=Yes; N=No.
Commissary Flag	1	Y=Yes; N=No.
MWR Flag	1	Y=Yes; N=No.
Exchange Flag	1	Y=Yes; N=No.
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	4	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	See DODI 1000.13.
Pay Grade	4	See DODI 1000.13.
Geneva Conventions Code	3	See DODI 1000.13.
Blood Type	3	See DODI 1000.13.
Total Characters	144 (excluding Version in header)	

Table 10 PDF417 Bar Code Format, Sponsor's ID Card, Version 3

Field Version	Size 1	Notes "3" in header
Sponsor Flag	1	"1" – Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix / DEERS Dependent Suffix Code	2	DDS: "20" / DDSC: "00"
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	S/N/R - See Appendix C
CHAMPUS Flag	1	M/N/F - See Appendix C
Commissary Flag	1	Y/N/X - See Appendix C
MWR Flag	1	Y/N/X - See Appendix C
Exchange Flag	1	U/N/L/X - See Appendix C
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	6	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	See DODI 1000.13.
Pay Grade	4	See DODI 1000.13.
Geneva Conventions Code	3	See DODI 1000.13.
Blood Type	3	See DODI 1000.13.
Total Characters	146 (excluding Version in header)	

Table 11 PDF417 Bar Code Format, Dependent's ID Card, Version 1

Field Version	Size 1	Notes "1" in header
Sponsor Flag	1	"0" – Dependent
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix	2	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	Y=Yes; N=No.
CHAMPUS Flag	1	C=Yes; N=No.
Commissary Flag	1	Y=Yes; N=No.
MWR Flag	1	Y=Yes; N=No.
Exchange Flag	1	Y=Yes; N=No.
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	4	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Sponsor Status	6	See DODI 1000.13.
Sponsor Branch of Service	5	See DODI 1000.13.
Sponsor Rank	6	See DODI 1000.13.
Sponsor Name	27	
Sponsor Person Designator Identifier	9	Usually, SSN
Relationship	6	See DODI 1000.13.
Total Characters	176 (excluding Version in header)	

Table 12 PDF417 Bar Code Format, Dependant's ID Card, Version 2

Field Version	Size 1	Notes "2" in header
Sponsor Flag	1	"0" – Dependent
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix	2	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	Y=Yes; N=No.
CHAMPUS Flag	1	C=Yes; N=No.
Commissary Flag	1	Y=Yes; N=No.
MWR Flag	1	Y=Yes; N=No.
Exchange Flag	1	Y=Yes; N=No.
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	4	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Sponsor Status	6	See DODI 1000.13.
Sponsor Branch of Service	5	See DODI 1000.13.
Sponsor Rank	6	See DODI 1000.13.
Sponsor Pay Grade	4	See DODI 1000.13.
Sponsor Name	27	
Sponsor Person Designator Identifier	9	Usually, SSN
Relationship	6	See DODI 1000.13.
Total Characters	180 (excluding Version in header)	

Table 13 PDF417 Bar Code Format, Dependent's ID Card, Version 3

Field Version	Size 1	Notes "3" in header
Sponsor Flag	1	"0" – Dependent
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN W
Family Sequence Number	1	See Appendix D.
Reserved for Future Use	9	
DEERS Dependent Suffix / DEERS Dependent Suffix Code	2	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Direct Care Flag	1	S/N/R - See Appendix C
CHAMPUS Flag	1	M/N/F - See Appendix C
Commissary Flag	1	Y/N/X - See Appendix C
MWR Flag	1	Y/N/X - See Appendix C
Exchange Flag	1	U/N/L/X - See Appendix C
CHAMPUS Effective Date	9	YYYYMMMDD format.
CHAMPUS Expiration Date	9	YYYYMMMDD format.
Form Number	6	See Table 5.
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix C.
Sponsor Status	6	See DODI 1000.13.
Sponsor Branch of Service	5	See DODI 1000.13.
Sponsor Rank	6	See DODI 1000.13.46
Sponsor Pay Grade	4	See DODI 1000.13.
Sponsor Name	27	
Sponsor Person Designator Identifier	9	Usually, SSN
Relationship	6	See DODI 1000.13.

Total Characters	182 (excluding Version in header)

4 DoD/Uniformed Services Civilian Identification Card Bar Code Formats

4.1 Population Served

There are three forms used to produce DoD/Uniformed Services civilian identification cards. The forms and their associated instructions are:

- Department of Defense Civilian Identification Card (DD Form 2750)–DODI 1000.22.
- United States DoD/Uniformed Services Civilian Geneva Conventions Identification Card (DD Form 2764) –DODI 1000.1. The DD Form 2764 is issued to individuals eligible for the manually prepared Geneva Conventions Identity Card (DD Form 489). The following categories of individuals are eligible for the DD Form 2764:
  - Emergency-Essential civilian employees of DoD, the Uniformed Services, or other government agencies.
  - Contract personnel who are essential when employed in regions of combat.
  - Non-combatant civilians deployed in conjunction with military operations overseas.
- Department of Defense/Uniformed Services Identification and Privilege Card (DD Form 2765) –DODI 1000.13. Categories of personnel eligible for the DD Form 2765 include:
  - Civilian employees of DoD, the Uniformed Services, and other government agencies, and civilian personnel under private contract to DoD or a Uniformed Service when stationed or employed in foreign countries who are not entitled to a Geneva Conventions card.
  - Civilian employees of DoD, the Uniformed Services, and other government agencies who reside on a military installation in CONUS, Hawaii, or Alaska.
  - Civilian employees of DoD, the Uniformed Services, other government agencies, and civilian personnel under private contract to DoD or a Uniformed Service, when stationed or employed in Puerto Rico or Guam.
  - Various categories of foreign personnel when serving in the United States or outside their own country in association with NATO or under sponsorship of DoD or a Military Service.
  - Certain members of the Red Cross, United Service Organization (USO), and United Seaman's Service (USS) when serving in foreign countries.
  - Contract surgeons when stationed in foreign countries, Puerto Rico, or Guam during their period of contract.
  - Military Sealift Command (MSC) personnel deployed to foreign countries on MSC vessels.
  - Transition Assistance Management Program (TAMP) members.
  - Voluntary Separation Incentive (VSI) and Special Separation Benefits (SSB) members.
  - Honorably discharged veterans rated by the VA as 100% disabled (100% DAV).

- Medal of Honor recipients.
- Former members (discharged) having reached age 60 and entitled to retired pay.
- Ships' officers (civilians) and crew members of NOAA vessels.
- Officers and crews, lighthouse keepers, and depot keepers of the former Lighthouse Service.

For the 21-character Code 39 format, applications can determine the specific population from the data in the bar codes as indicated in Table 14. For the 18-character format, the population group can be determined from the Personnel Category Code. See Appendix C.

Table 14 DoD/Uniformed Services Civilian ID Card Types

Code 39	PDF417	Definition
Bar Code Version	Form Number	
K	2750	Department of Defense Civilian ID Card
L	2764	U.S. DoD/Uniformed Services Civilian Geneva Conventions ID Card
M	2765	DoD/Uniformed Services ID and Privilege Card
D	1173	Information only. Uses original Sponsor 1173 format. U.S. Uniformed Services ID and Privilege Card (foreign nationals).
J	1173-1	Information only. Uses original Sponsor 1173 format. U.S. Uniformed Services Identification and Privilege Card (Reserve Retired – TA).

4.2 Data Notes

A listing of the fields in each version of the Code 39 bar code and a brief description of each field are shown in the figures that follow. Layouts and data characteristics are summarized in Figure 6 , Figure 7 , and Table 15, respectively. See DODI 1000.13, Service implementing directives, and the DEERS Data Dictionary for more information on coding and data derivation.

4.3 Code 39

The Code 39 bar code on the USID cards has evolved over time into the two versions that currently exist. Three columns were removed from the Security Code of the 21-character version to provide an 18-character symbol. This change aligns the Code 39 formats of these cards with that of the CAC.

Because of differing data content associated with each form, the bar code format for each card type varies. Layouts of the Code 39 bar code for each card type in the bar code are provided in Figure 6 and Figure 7 , and a description of each field is shown in Table 15. Descriptions of the codes and tables showing interaction of the codes are provided in Appendices D and E. See applicable DODIs, Service implementing directives, and the DEERS Data Dictionary for more information on coding and data derivation.

The Person Designator Identifier is compressed. Instructions for decompressing this field are provided in Appendix C.

Each card that has been issued to an individual is uniquely identified by a 4-character Card Security Code (re-designated the 1-character Card Instance Identifier in the CAC format). The Card Security Code from the most current card is stored in the DEERS database. This code is changed at each re-issuance and can be used to detect fraudulent use of lost or stolen cards. Applications using this code to detect fraudulent use of cards will require personnel to re-register in their local system each time they obtain a new card.

Figure 6 Civilian ID Card Code 39 Bar Code Formats (21 characters)

VC[1]	Person Designator Identifier (PDI)[2]						RFU[3]						SC[4]	MC[5]	SV[6]	PT[7]	Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

1. DD Form 2750 DoD Civilian ID Card (Version Code K)

VC[1]	Person Designator Identifier (PDI)[2]						RFU[3]						SC[4]	MC[5]	SV[6]	PT[7]	Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

2. DD Form 2764 Geneva Convention Card (Version Code L)

VC[1]	Person Designator Identifier (PDI)[2]						Pay Grade						SC[4]	MC[5]	SV[6]	PT[7]	Card Security Code			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

3. DD Form 2765 Identification and Privilege Card (Version Code M)

1. VC = Bar Code Version Code
2. SSN, etc.; Identifier is compressed
3. RFU = Reserved for Future Use
4. SC = Service/Component Code
5. MC = Member Category
6. SV = Service
7. PT = Person Designator Type Code

Figure 7 Civilian ID Card Code 39 Bar Code Formats (18 characters)

VC[1]	Person Designator Identifier (SSN, etc.)[2]						PT[3]	DoD EDI Person Identifier[2]							PC[4]	BC[5]	CI[6]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

1. DD Form 2750 DoD Civilian ID, DD Form 2764 Geneva Convention, and DD Form 2765 Identification and Privilege Cards (Version Code 1)

1. VC = Bar Code Version Code
2. SSN, etc.; Identifier is compressed
3. PT = Person Designator Type Code
4. PC = Personnel Category Code
5. BC = Branch Code
6. CI = Card Instance Identifier

Table 15 Code 39 Bar Code Detail

Field	Length	Description
Bar Code Version	1	Indicates bar code format and card type. See Table 14.
Person Designator Identifier (Cardholder)	6	Usually the person's SSN.
Person Designator Type Code	1	See Appendix C.
RFU	Varies	Reserved for Future Use. These fields are filled with spaces.
Service/Component Code	4	See Appendix C.
Member Category	1	See Appendix C.
Personnel Category	1	See Appendix C.
Service/Branch Code	1	See Appendix C.
Card Security Code[1]	4	Machine generated four-character code used for card security purposes.
Card Instance Identifier	1	Machine-generated random code used for security purposes to distinguish the card from other cards issued to the same cardholder. Replaces 4-digit Card Security Code.

1. The first position of the Card Security Code field on cards produced on deployable RAPIDS contains a period (.).

4.4 PD417

The PDF417 bar code found on DoD/Uniformed Services Civilian ID Cards contains three types of data:

- Header Data
- Text Data
- Digital Photograph Data

4.4.1 Header Data

The header information contains data used to decode the PDF417 bar code. A layout of the PDF417 header record and a description of each field contained in the PDF417 header segment are provided in Figure 8 and Table 16.

Figure 8 PDF417 Header Fields

Identification Code				Ver	PDF417 Size		Sum	RSize
1	2	3	4	5	6	7	8	9

Table 16 PDF417 Header Field Detail

Field	Size	Description
Identification Code	4	Indicates population category. See following tables.
Ver	1	The version (currently 1, 2, or 3) of the PDF417 bar code for the form type shown by the Identification Code.
PDF417 Size	2	Length of PDF417 bar code following this field. This value plus 7 should equal the total length of the bar code read.
Checksum	1	Checksum of the bytes in the bar code.
RSize	1	Indicates the size of the RAPIDS text data contained in the PDF417 bar code.

4.4.2 Text Data

Data from most of the fields on the ID card is encoded into this portion of the PDF417 bar code. Because of differing data content associated with each form, the bar code format for each card type varies. Currently, the versions in circulation vary for the three card types as follows:

- DoD Civilian ID Card (DD Form 2750), 3 versions.
- U.S. DoD/Uniformed Services Civilian Geneva Conventions ID Card (DD Form 2764), 1 version.
- DoD/Uniformed Services ID and Privilege Card (DD Form 2765), 1 version.

Appendix D contains the layouts of the RAPIDS data for the three types. See Appendix F, DODI 1000.13 and Service implementing directives, and the DEERS data dictionary for more information on coding and data derivation.

4.4.3 Digital Photograph Data

The digital photograph encoded into the last part of the PDF417 is a compressed version of the photograph printed on the front of the card. The photograph is compressed using the Joint Photographic Expert Group's (JPEG) standardized compression method for gray-scale images and stored in the JPEG File Interchange Format (JFIF). The JPEG compression is considered "lossy," meaning that the output image is not necessarily identical to the input image but high compression is possible.

Table 17 PDF417 for DD Form 2750, DoD Civilian ID Card

Field Version	Size 1	Notes “3” in header
Sponsor Flag	1	“1” = Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder’s SSN.
Person Identifier Type Code	1	See Appendix C.
Reserved for Future Use	9	Formerly, SSN.
Service Code	1	See Appendix D.
Member Category Code	1	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Organization – Part II	23	Positions 36-58
Form Number	6	“2750” (left justified)
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix D.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	Not used.
Pay Grade	7	See DODI 1000.22.
Geneva Conventions Code	3	Not used.
Blood Type	3	See DODI 1000.13.
Organization – Part I	35	First 35 characters.
Total Characters	184	(excluding Version in header)

Table 18 PDF417 for DD Form 2764, Geneva Conventions Card

Field Version	Size 1	Notes "3" in header
Sponsor Flag	1	"1" = Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN.
Person Identifier Type Code	1	See Appendix C.
Reserved for Future Use	9	Formerly, SSN.
Service Code	1	See Appendix D.
Member Category Code	1	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Organization – Part II	23	Positions 36-58
Form Number	6	"2764" (left justified)
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix D.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	Not used.
Pay Grade	7	See DODI 1000.13.
Geneva Conventions Code	3	See DODI 1000.1
Blood Type	3	See DODI 1000.13.
Organization – Part I	35	First 35 characters.
Total Characters	184 (excluding Version in header)	

Table 19 PDF417 for DD Form 2765, Identification and Privilege Card

Field Version	Size 1	Notes "3" in header
Sponsor Flag	1	"1" = Sponsor
Name	27	
Person Designator Identifier (Cardholder)	9	Usually, the cardholder's SSN.
Person Identifier Type Code	1	See Appendix D.
Reserved for Future Use	9	Formerly, SSN.
Service Code	1	See Appendix D.
Member Category Code	1	See Appendix D.
Height	2	See DODI 1000.13.
Weight	3	See DODI 1000.13.
Hair Color	2	See DODI 1000.13.
Eye Color	2	See DODI 1000.13.
Date of Birth	9	YYYYMMMDD format.
Organization – Part II	23	Positions 36-58
Form Number	6	"2765" (left justified)
Card Issue Date	9	YYYYMMMDD format.
Card Expiration Date	9	YYYYMMMDD format.
Security Code	4	Machine generated.
Service/Component Code	1	See Appendix D.
Status	6	See DODI 1000.13.
Branch of Service	5	See DODI 1000.13.
Rank	6	Not used.
Pay Grade	7	See DODI 1000.13.
Geneva Conventions Code	3	Not used.
Blood Type	3	Not used.
Organization – Part I	35	First 35 characters.
Total Characters	184 (excluding Version in header)	

5 DBIDS Card Bar Code Formats

5.1 Code 39 (DBIDS 2.7.3 and 3.1.0)

Code39 – This format is only applicable to DBIDS 2.7.3 and previous versions, as well as 3.1.0 (USFK, MP, IACS, and SWA)

The code 39 of the current DBIDS format is 21 characters long, where the format is as follow:

Table 20 Code 39 Bar Code

Field	Position	Description
VER	1	DBIDS Card version Value: N – Permanent Card O – Temporary Card (IACS only)
ID	2 – 16	Identification Number Value: Alpha Numeric
ID_TYP_CD	17	Identification Type Code: Value: S – SSN P – Passport Number F – Foreign Identifier T – Temporary Identifier I – Personal Identification Number (IACS only) D – Driver License Number E – DoD EDIPI O – Other
SC	18-21	Security Code Value: Alpha Numeric

There are several drawbacks to this format:

- 21 characters printed on the plastic DBIDS card is the maximum length allowed, any longer will make barcodes hard to scan or not-scannable. The code 39 on CACs (only 18 characters) are still hard to scan by certain manufacture scanners, the same applies to DBIDS cards.
- Personal Identification is encoded into the barcode string, which may cause privacy concerns.
- The code 39 barcode on DBIDS cards is unique in the DBIDS regional boundary, but it is possible to have the same code 39 string generated in other DBIDS region, which is not globally unique in the federated DBIDS world for enterprise development.
- The barcode string does not include DBIDS issuance location. From the perspective of federated DBIDS and a programming stand point this is an essential feature.

5.2 Code 39 (DBIDS 4.x and above) Format

To overcome these shortcomings and align the design of the Next Generation DBIDS card, which must be compliant with HSPD-12 and FIPS-201 (PIV – Personal Identify Version), a new format of code 39 was developed based on the concept of the CHUID specification. (Please see "NIST SP 800-73" for more information).[1]

Code 39 – For DBIDS 4.x or future version (There is a separate document "Code39_format_and_implementation_for_DBIDS" on how to generate such barcodes)

This format uses the first part of the FASC-N from the CHUID specification. DBIDS will logically merge the Credential number, Credential Series and Individual Credential Issue by using one sequence on the database and populating all three fields generating a sequence up to 99,999,999 instead of just 999,999. The fields and descriptions are:

Table 21 FASC-N

Field	Position	Description
AC	1 – 4	Agency Code Value: 9748 – DHRA Non-Federal Issuer code is 9999 and AOR issuers within DOD can use standard agency codes listed in SP 800-87 (note: Definition of Agency Code is from NIST Special Publication 800-87)
SC	5-8	System Code: Value: 0001 (DBIDS 4.0 CONUS Base Repository) 0002 (DBIDS 4.0 CONUS Vehicles) 9900-9999 reserved for development / testing Unique number ranging between 1 and 9999 to identify the enrollment and/or issuance system or station used
CN	9-16	Credential Number Value: Unique number ranging between 1 and 99,999,999 to identify the individual credential issued by a particular enrollment and/or issuance system or station
OC	17	Organizational Category Value: 5 (local pop - i.e. DBIDS) Dependent on issuer (Federal, State, Commercial, Foreign, Locally Assigned), used with Organizational Identifier for non-federal issuer when Agency Code is set to 9999
OI	18-21	Organizational Identifier Value: The Agency Code repeated

[1] http://csrc.nist.gov/publications/nistpubs/800-73-1/sp800-73-1v7-April20-2006.pdf

5.3 PDF417 (DBIDS 2.7.3 and 3.1.0)

The following PDF417 is supported for DBIDS 2.7.3 and previous versions, as well as 3.1.0 (USFK, MP, IACS, and SWA).

Table 22 PDF417

Field	Position	Description
Card_ID (Header data)	1-4	DBIDS Card ID Value: IDBD
Card Version (Header data)	5	DBIDS Card Version Value: Numeric
PDF417_SIZE (Header data)	6-7	PDF417 size – length of barcode following this header data. Value: numeric (note: value is encoded in binary)
PDF417_Checksum (Header data)	8	Checksum of the bytes in the barcode Value: numeric (note: value is encoded in binary)
PDF417_RSize (Header data)	9	The size of actual data (excluding the header data) Value: numeric (note: value is encoded in binary)
Person_Name	10-36	Person Name Convention Format: (Last Name, First Name Middle Name)
Person_ID	37-51	Identification Number
Person_ID_TYP	52	Identification Type Code: Value: S – SSN P – Passport Number F – Foreign Identifier T – Temporary Identifier I – Personal Identification Number (IACS only) D – Driver License Number E – DoD EDIPI K – Korean Identifier (KID; Korea Only) O – Other
Person_Height	53-54	Person Height Value: numeric
Person_Weight	55-57	Person Weight Value: numeric
Person_HairColor	58-59	Hair Color Code - Same as RAPIDS
Person_EyeColor	60-61	Eye Color Code – Same as RAPIDS
Person_DateOfBirth	62-70	Date of Birth Convention format: YYYYMMMDD
Card Type	71-75	Card Type
Card_IssueDate	76-85	Card Issue Date Convention format: YYYYMMMDD
Card_ExpirationDate	86-94	Card Expiration Date Convention format: YYYYMMMDD

Card_SecurityCode	94-98	Security Code Value: Alpha Numeric

6 Neo Tracking System

Barcode 39 NTS The current NTS bracelet barcode is a code39 that is 8 characters in length. The first seven characters are numbers and the eighth character is a check digit that is the modulus 43 sum of the first 7 numbers.

An example NTS barcode is:
5484002N

The check digit calculation is performed as follows:
5 + 4 + 8 + 4 + 0 + 0 + 2 = 23
23 % 43 = 23 or 'N'

Here is the check digit translation chart:

Table 23 Modulo 43 Character Set

Char	Value		Char	Value		Char	Value		Char	Value
0	0		C	12		O	24		-	36
1	1		D	13		P	25		.	37
2	2		E	14		Q	26		space	38
3	3		F	15		R	27		$	39
4	4		G	16		S	28		/	40
5	5		H	17		T	29		+	41
6	6		I	18		U	30		%	42
7	7		J	19		V	31			
8	8		K	20		W	32			
9	9		L	21		X	33			
A	10		M	22		Y	34			
B	11		N	23		Z	35			

Appendix A Supplemental Bar Code User/Application Data Sheet

Not necessary to repeat information provided in CAC Enabled Application Information Form)

1. Application Name:
2. Primary Point of Contact:
   a. Name:
   b. Job Title:
   c. Organization:
   d. Mailing Address:

   e. E-mail Address:
   f. Phone -- Commercial: DSN: FAX:
3. Secondary Point of Contact (a contact that is likely to remain aware of the project for a long time)
   a. Name:
   b. Job Title:
   c. Organization:
   d. Mailing Address:

   e. E-mail Address:
   f. Phone -- Commercial: DSN: FAX:
4. Application Data:
   a. Description (A few sentences; operating environment—Win98, NT, VB, C++, Office 97, etc.; number of readers (Code 39 or PDF417); number of terminals; number of bases/locations; user population-AD/Res/NG/Civ, retirees, or dependents):
   b. Implementation Status/Plans:X
5. Contractors/System Suppliers:
   a. Company:
   b. Contact Name:
   c. Job Title:
   d. Organization:
   e. Mailing Address:

   f. E-mail Address:
   g. Phone -- Commercial: DSN: FAX:

Appendix B Decompressing Person Identifiers and Dates

Compressed person identifiers are stored in bar codes as six or seven character Base 32 numbers. Decompressing a person identifier is simply a matter of converting the Base 32 number to a decimal number as shown in the first section. Dates are stored in the bar code as Base 32 numbers representing the number of days from a base date (1 January 1000). Decompressing a date is a three-step process. Details for conversion for several popular platforms are shown in section 2.

B.1 Base-32 to Decimal Conversion

The concept and conversion arithmetic of the Base-32 number system is identical to that of the hexadecimal (base 16) number system common to the computer industry. There are thirty-two symbols represented by the ten decimal digits 0 through 9 and the first twenty-two alphabetic characters A through V. The letter A represents the 11th symbol in the system and is equivalent to a decimal 10. The letter V represents the 32nd symbol and is equivalent to a decimal 31.

Conversion from a base 32 number to decimal can be accomplished by setting up a table pairing each base 32 symbol (0-9 & A-V) with its corresponding decimal value (0-31) and calculating as follows:

1. Using the table, convert each individual Base-32 digit to its corresponding decimal value.
2. Multiply each converted value by the power of 32 that corresponds to its position in the Base-32 number. The power of the least significant digit is zero. [One of the mysteries of mathematicians: Any number to a power of zero equals one.]
3. Sum the products to obtain the converted value.

The following conversion of the Base-32 number V62G illustrates the foregoing steps:

V		**6**		**2**		**G**
$(31) \times 32^3$	+	$(6) \times 32^2$	+	$(2) \times 32^1$	+	$(16) \times 32^0$
(1,015,808)	+	(6,144)	+	(64)	+	(16) = 1,022,032

For character coding systems, such as ASCII, that encode the letters A-Z sequentially, the Microsoft Access Visual Basic for Applications (VBA) function in Figure 9 and the C-language computer code shown in Figure 10 will perform the conversion. That code implements the following form of the foregoing equation, beginning at the innermost set of parentheses:

V	**6**	**2**	**G**		
(((((((0 x 32) + 31) x 32) + 6) x 32) + 2) x 32) + 16	=	1,022,032			

These routines use standard integer (32-bit) variables to accept the result of the conversion. The application can then use standard formatting functions to display the decimal version of the number. This arrangement works fine for 9-digit decimal numbers (0 - 999,999,999). However, this word size is insufficient for 10-digit decimal numbers and a 64-bit integer is required to perform the conversion for the larger numbers (e.g., EDIPI). In VBA, the floating point "Double," and in C/C++, the 64-bit integer "hyper" data types provide the larger word size.

B.2 Date Conversion

Dates are stored in the bar code as Base 32 numbers representing the number of days from a base date (1 January 1000). Conversion to conventional date displays is a three-step process:

1. Convert the Base 32 number to a decimal number using the routines described in Section 1.
2. Add a base adjustment factor that depends on the platform running the application. See Table 24. This platform-specific conversion factor represents the numbers of days between the base date used in the bar code date (1 January 1000) and the base date of the operating system/development environment under which the application is running.
3. Use the system's date formatting function or the routine shown in Figure 11 to convert the date value to a standard date format.

The routine shown in Figure 11 uses the concept of Julian date as used within the astronomical community. This "Julian date" concept is different from the more familiar concept of "Julian day of the year" (1-366). The Julian date concept used in the routine is based on the number of days from a base date of 1 January 4313 BC. A search of the literature or the Internet shows some confusion and inconsistency among the implementations of the Julian date concept. Most of this, stems from conflicting data on the adjustments in the 1500s to implement the modern calendar and some controversy over which year to use for 1 January 0001. Anyone feeling inclined to explore the conflicts in date routines can contact the bar code support office for a spreadsheet that may help explain the differences. The sample software includes some date conversion utilities for experimenters.

The routine that generates the dates used in the CAC bar code uses the inverse of this routine to generate a Julian date by converting a standard date to the number of days from 4313 BC. The routine then subtracts out the Julian date for 1 January 1000 to reduce the size of the number. For our purposes we only need to know that the bar code date is the number of days

from 1 January 1000 and that the factors in 0 will convert the stored date to the appropriate reference system.

The conversion routine is dependent on truncated (un-rounded) integer arithmetic. Visual Basic and Visual Basic for Applications implements this with the backslash (\) division operator. C/C++ implements truncated integer arithmetic with the standard division operator (/), as long as both operands are integer numbers. Failure to use truncated integer arithmetic will result in erroneous results.

Table 24 Factors to Adjust Bar Code Dates to Various Application Operating Environments

Operating Environment	Base Date (Day 0)	Factor to Add to Bar Code Date	Notes
Microsoft Access - Date data type and Format	30 Dec 1899 00:00	-328,716	
Microsoft Excel – Date cell format	30 Dec 1899 00:00	-328,716	
Visual Basic - Date data type and Format	30 Dec 1899 00:00	-328,716	
C++ - COleDateTime/ COleDateTimeSpan	30 Dec 1899 00:00	-328,716	
C++ - CTime/CTimeSpan	31 Dec 1969 00:00	-354,284	
Julian Date Routine (Figure 11)	1 Jan 4312 BC 12:00	+2,086,303	

Figure 9 Visual Basic for Applications (VBA) Base 32 Conversion Function

```
/*****************************************************************************
' FUNCTION: Convert Base 32 to Binary
' PURPOSE:  To convert ASCII string representing a Base 32 number to binary
' CALL:  PDI = Format$(B32toBin(Mid$(BC_Data, hdr+PDFSSN, 6), 6), "000-00-0000")
' ARGUMENTS:
'    B32:   A k-digit Base 32 number string (range of digits:  0-V)
'    B32_Length:  Number of numeric ASCII B32 digits in string to convert
'    RETURN B32:   A binary integer, or -1 for an error
' NOTE:  If this routine is to be used for decimal numbers greater than 999,999,999, such as
'    EDIPI, the data type for the return parameter and BinNr should be set to Double rather
'    than Long.
 *****************************************************************************/
Function B32toBin(B32 As String, B32_Length As Integer) As Long
    Dim BinNr As Long, B32Chr As Integer, iChr As Integer
    Dim Asc_A As Integer: Asc_A = Asc("A")
    Dim Asc_0 As Integer: Asc_0 = Asc("0")
    BinNr = 0      ' Clear binary accumulator
    For iChr = 1 To B32_Length
        B32Chr = Asc(Mid$(B32, iChr, 1))      ' Get the Base32 digit
        If B32Chr >= Asc_A  Then              ' Could check range here to assure <= V
            B32Chr = B32Chr - Asc_A + 10      ' A-V  → 10-31
        Else
            B32Chr = B32Chr - Asc_0           ' alph 0-9 → numeric 0-9
        End If
        BinNr = BinNr * 32 + B32Chr           ' Shift accumulator 5 bits left add new 5-bit digit
        Next
    B32toBin = BinNr
End Function
```

Figure 10 C-Language Base-32 Conversion Function

```
/*****************************************************************************************`****
 FUNCTION:  Convert Base-32 to Base-10.
 PURPOSE:   To convert ASCII string representing a Base-32 number to ASCII string representing a
            Base-10 number.
 CALL:      UINT result = B32toBin(szB32, szB32Size, buf, &bufLen);
 ARGUMENT:  szB32:   A null-terminated Base-32 number string (range of digits:  0-V).
            szB32Len: The size of the Base-32 string.
            buf: The buffer to store the Base-10 string.
            bufLen: The length of the Base-10 string.
 RETURN:    SUCCESS on successful conversion.
*****************************************************************************************/
UINT B32toB10(UCHAR* szB32, UINT szB32Len, UCHAR* buf, UINT* bufLen) {
    unsigned __int64 binNr = 0;
    UINT index, slim;
    slim = szB32Len;
    binNr = 0;
    if(buf == NULL || (INT)*bufLen < 10) {
        return INVALID_BUFFER;
    }
    if(szB32 == NULL || szB32Len < 0) {
        return INVALID_PARAMETER;
    }
    for (index = 0; index<slim; index++) {
        if(!(isdigit(szB32[index]) || (isupper(szB32[index]) && (szB32[index] <= 'V')))){
            return NUMBER_FORMAT_ERROR;
        }
        if(isdigit(szB32[index])){
            binNr = binNr * 32 + (szB32[index] - (UINT) '0');
        }
        else {
            binNr = binNr * 32 + (szB32[index] - (UINT) 'A' + 10);
        }
        if(binNr > ((unsigned __int64)pow(2,64) - 1)){
            return NUMBER_FORMAT_ERROR;
        }
    }
    UINT power=0;
    for(unsigned __int64 i=binNr; i>0; i/=10){
        power++;
    }
    power--;
    UCHAR* buffer = new UCHAR[15];
    stringstream strStream;
    for(UINT j=(UINT)pow((double)10, (INT)power); j>0; j/=10){
        strStream << (UCHAR)((UCHAR)(binNr/j%10)+'0');
    }
    strncpy((CHAR*)buf, strStream.str().c_str(), strStream.str().length());
    *bufLen = (UINT)strStream.str().length();
    return SUCCESS;
 }
```

Figure 11 Visual Basic for Applications Julian Date Conversion Function

```
'*************************************************************************************************
'    FUNCTION: Days_to_Date
'    SYNOPSIS: Converts a number of days since some distant but unspecified epoch into a date.
               You can use this function to calculate differences between dates, and forward
               dates.  Use date_to_days() to calculate the reverse function.  Author: Robert G.
               Tantzen, translated from the Algol original in Collected Algorithms of the CACM
               (algorithm 199).  Original translation into C by Nat Howard, posted to Usenet
               5 Jul 1985.
' -----------------------------------------------------------------------------------------------
'    SOURCE:   Extracted from Standard Function Library (SFL) -- Date and time functions
'    NAME:     sfldate.h / sfldate.c         WRITTEN:  1996/01/06   REVISED:  2000/01/19
'    AUTHOR:   iMatix SFL project team sfl@imatix.com
'    Copyright: Copyright (c) 1996-2000 iMatix Corporation
'    LICENSE:  This is free software; you can redistribute it and/or modify it under the terms
               of the SFL License Agreement as provided in the file LICENSE.TXT.  This
               software is distributed in the hope that it will be useful, but without any
               warranty.
'*************************************************************************************************
Public Function Days_to_Date(days As Long) As Long
    Dim century As Long, year As Long, month As Long, day As Long

    days = days - 1721119     ' 1/1/0001 AD/CE
    century = (4 * days - 1) \ 146097
    days = 4 * days - 1 - 146097 * century
    day = days \ 4
    year = (4 * day + 3) \ 1461
    day = 4 * day + 3 - 1461 * year
    day = (day + 4) \ 4
    month = (5 * day - 3) \ 153
    day = 5 * day - 3 - 153 * month
    day = (day + 5) \ 5
    If (month < 10) Then
        month = month + 3
      Else
        month = month - 9
        If (year + 1 = 99) Then
            year = 0
            century = century + 1
          End If
      End If      // Combine into single integer to simplify passing back results
    Days_to_Date = ((century * 100) + year) * 10000 + month * 100 + day   // YYYYMMDD
End Function
```

Figure 12 C-Language Julian Date Conversion Function

```
/*****************************************************************************************`****
 FUNCTION:  Convert Julian Date to standard date.
 PURPOSE:   Converts the number of days from January 1, 1000 to the standard date format.
 CALL:      int result = converFromJulian(sjulian, len, buf, &bufLen);
 ARGUMENT:  sjulian:  The number of days from January 1, 1000 represented as an ASCII string.
            len: The length of the Julian date.
            buf: The buffer to store the Julian date string in the following format YYYYMMDD.
            bufLen: The length of the Julian date string.
 RETURN:    SUCCESS on successful conversion.
*****************************************************************************************/
UINT convertFromJulian(UCHAR* sjulian, UINT len, UCHAR* buf, UINT* bufLen) {
    if(sjulian == NULL) return INVALID_PARAMETER;
    long julian = strtoul((const char*)sjulian,NULL,0)+2086303;
    double intgr = floor((double)julian);
    double frac = julian - intgr;
    double gregjd = 2299161;
    double j1;
    if (intgr >= gregjd) {
        double tmp = floor(((intgr - 1867216) - 0.25) / 36524.25);
        j1 = (intgr + 1 + tmp) - floor(0.25 * tmp);
    }
    else {
        j1 = intgr;
    }
    double dayfrac = frac + 0.5;
    if (dayfrac >= 1.0) ++j1;
    double j2 = j1 + 1524;
    double j3 = floor(6680.0 + (((j2 - 2439870) - 122.1) / 365.25));
    double j4 = floor(j3 * 365.25);
    double j5 = floor((j2 - j4) / 30.6001);
    int day = (UINT) floor(j2 - j4 - floor(j5 * 30.6001));
    int month = (UINT) floor(j5 - 1);
    if (month > 12) {
        month -= 12;
    }
    int year = (UINT) floor(j3 - 4715);
    if (month > 2) {
        --year;
    }
    if (year <= 0) {
        --year;
    }
    if (year < 0) {
        year = -year;
    }
    long date = (year) * 10000 + month * 100 + day;
    if(buf==NULL||*bufLen < 8) return INVALID_BUFFER;
    _ltoa(date, (CHAR*)buf, 10);
    return SUCCESS;
}
```

Appendix C Data Encoding for Common Access and DoD/Uniformed Services ID Cards

This section contains tables listing and describing the data elements and codes used on the Common Access Card (CAC), Uniformed Services Identification Cards, DoD Identification and Privilege Cards, and DoD/Uniformed Services Civilian Identification Cards. Additional tables describing data elements being phased out are provided in Appendix D.

List of Tables

Table 25 Person Designator Type Codes

Code	Person Designator Type
S	Social Security Number (SSN)
N	Nine-digit code that looks like an SSN, but is not in a valid SSN range.
P	Special nine-digit code created for U.S. military personnel from Service numbers before the switch to SSNs.
D	Special nine-digit code created for individuals (i.e., babies) who do not have or have not provided an SSN when the person is added to DEERS (dependents only). Known as a Temporary Identifier Number (TIN).
F	Special nine-digit code created for foreign military and nationals. Known as a Foreign Identifier Number (FIN).
T	Test (858 series)
I	Individual Taxpayer Identification Number

Table 26 Branch (Service) Codes

Branch Code	Branch Service
A	USA
C	USCG
D	DoD
F	USAF
H	USPHS
M	USMC
N	USN
O	NOAA
1	Foreign Army
2	Foreign Navy
3	Foreign Marine Corps
4	Foreign Air Force
X	Other/Not Applicable

Table 27 Personnel/Member Category Codes

Category Code		Category Description
Personnel	Member	
A	A	Active duty member
B	B	Presidential Appointee
C	C	DoD civil service employee
D	D	100% disabled American veteran
E	E	DoD contract employee
F	F(P[1])	Former member (a 20-year active-duty serviceperson who was eligible to retire but chose discharge)
N	G	National Guard member (mobilized or on active duty for 31 days or more)
H	H	Medal of Honor recipient
I	I	Non-DoD civil service employee
J	J	Academy student (does not include Officer Candidate School)
K	K	non-appropriated fund (NAF) DoD employee
L	L	Lighthouse service
M	M	Non-Government agency personnel (e.g., American Red Cross)
N	N	National Guard member (not on active duty or on active duty for 30 days or less)
O	O	Non-DoD contract employee
Q	Q	Reserve retiree not yet eligible for retired pay
R	R	Retired Uniformed Service member eligible for retired pay
V	S	Reserve (mobilized or on active duty for 31 days or more)
T	T	Foreign military member
U	U	Foreign national employee (DoD or non-DoD)
V	V	Reserve member (not on active duty or on active duty for 30 days or less)
W	W	DoD beneficiary (person who receives benefits based on prior association, condition, or authorization; e.g., former or surviving spouse)
Y	Y	Retired DoD Civil Service Employees

1. Transitional Assistance Management Program (TAMP) shows as “P” in Member Category Code.

Table 28 Personnel Entitlement Condition Type Codes

Code	Personnel Entitlement Condition Type
01	On Active duty (e.g., Guard/Reserve or retiree). Segment condition.
02	Mobilization. Segment condition.
03	On appellate leave. Segment condition.
04	Military prisoner. Segment condition.
05	POW/MIA. Segment condition.
06	Separated from Selected Reserve. This is an event condition.
07	Declared permanently disabled after temporary disability period. Event condition.
08	On non-CONUS assignment. Segment condition.
09	Living in Guam or Puerto Rico. Segment condition.
10	Living in government quarters. Segment condition.
11	Death determined to be related to an injury, illness, or disease while on Active duty for training or while traveling to or from a place of duty. Event condition.
12	Discharged due to misconduct involving family member abuse. (Sponsors who are eligible for retirement.) Segment condition.
13	Granted retired pay. Event condition.
14	DoD sponsored in U.S. (foreign military). Segment condition.
15	DoD non-sponsored in U.S. (foreign military). Segment condition.
16	DoD sponsored overseas. Segment condition.
17	Deserter. Segment condition.
18	Discharged due to misconduct involving family member abuse. (Sponsors who are not eligible for retirement.) Segment condition.
19	Reservist who dies after receiving their 20 year letter. This is an event condition.
20	Transitional assistance (TA-30). Segment condition.
21	Transitional assistance (TA-Res). Segment condition.
22	Transitional assistance (TA-60). Segment condition.
23	Transitional assistance (TA-120). Segment condition.
24	Transitional assistance (SSB program). Segment condition.
25	Transitional assistance (VSI program). Segment condition.
26	Transitional assistance (composite). Segment condition.
27	Senior Executive Service (SES).
28	Emergency Essential – overseas only.

29	Emergency Essential – CONUS.
30	2Emergency Essential – CONUS living in quarters, living on base, and not drawing a basic allowance for quarters, serving in an emergency essential capacity.
31	Reserve Component TA-120 Reserve Component Transition Assistance TA 120 (Jan 1, 2002 or later)
32	On MSC owned and operated vessels Deployed to foreign countries on Military Sealift Command owned and operated vessels. Segment condition.
33	Guard/Reserve Alert Notification Period Guard/Reserve Alert Notification Period
34	Reserve Component TA-180 – 180 days TAMPS for reserve return from named contingencies (was 60 before Nov 5 2003)
35	Reserve Component TA-180 – 180 days TAMPS for reserve return from named contingencies (was 120 before Nov 5 2003)
36	TA-180 – 180 days TAMP for involuntary separation (was 60 before Nov 5 2003)
37	TA -180 180 days TAMPS for involuntary separation (was 120 before Nov 5 2003)
38	Living in Government Quarters in Guam or Puerto Rico, Living on base and not drawing an allowance for quarters in Guam or Puerto Rico.
39	Reserve Component TA-180 – TAMP – Mobilized for Contingency
40	TA – 180 TAMP – SPD Code Separation
41	TA-180 – TAMP – Stop/Loss Separation
42	DoD Non-Sponsored Overseas – Foreign Military personnel serving OCONUS not sponsored by DoD

Table 29 Track Between Uniformed Service Member Affiliation and Status Codes

Duty Status (days)	Branch/ Component	Branch Code	Personnel/ Member Category[1]	Personnel Entitlement Condition	Service/ Component Code
Active	USA	A	A	01	A
Active	USN	N	A	01	B
Active	USAF	F	A	01	C
Active	USMC	M	A	01	D
Active	USCG	C	A	01	E
Active	USPHS	H	A	01	F
Active	NOAA	O	A	01	G
Active (31+)	USAR	A	V/S	01/02	O
Not active	USAR	A	V	Not 01/02	P
Active (31+)	USNR	N	V/S	01/02	Q
Not active	USNR	N	V	Not 01/02	R
Active (31+)	USAFR	F	V/S	01/02	S
Not active	USAFR	F	V	Not 01/02	T
Active (31+)	USMCR	M	V/S	01/02	U
Not active	USMCR	M	V	Not 01/02	V
Active (31+)	USCGR	C	N/G	01/02	W
Not active	USCGR	C	N	Not 01/02	X
Active (31+)	USAG	A	N/G	01/02	Y
Not active	USAG	A	N	Not 01/02	Z
Active (31+)	ANG	F	N/G	01/02	1
Not active	ANG	F	N	Not 01/02	2
Retired	USA	A	R	N/A	H
Retired	USAR	A	Q	N/A	3
Retired	USN	N	R	N/A	I
Retired	USNR	N	Q	N/A	4
Retired	USAF	F	R	N/A	J
Retired	USAFR	F	Q	N/A	5
Retired	USMC	M	R	N/A	K
Retired	USMCR	M	Q	N/A	6
Retired	USCG	C	R	N/A	L
Retired	USCGR	C	Q	N/A	7

Retired	USPHS	H	R	N/A	M
Retired	NOAA	O	R	N/A	N
Other	Any Uniformed Service/DoD	Any Uniformed Service/DoD	B/C/E/D/F/H/J/K /Q/T/W/Y	N/A	0
Other	Any	Any	I/L/M/O/U	N/A	0

1. Not exhaustive; other Member Category Codes may also apply if cardholder has dual status (e.g., Reservist and DoD employee or contractor)

Table 30 Privilege/Benefit Flags

Privilege/Benefit	Flag
Direct Care	Unlimited (S), Not Eligible (N), and Reimbursable (R)
Civilian Health Care	CHAMPUS (M), Not Eligible (N), and Foreign Outpatient/Reimbursable (F)
Commissary	Eligible and Active (Y), Not Eligible (N), and Eligible, but Removed (X)
Morale, Welfare, & Recreation (MWR)	Eligible and Active (Y), Not Eligible (N), and Eligible, but Removed (X)
Exchange	Unlimited (U), Not Eligible (N), Limited (L), and Eligible, but Removed (X)

Appendix D Data Encoding for Legacy Identification Cards

This section contains tables listing and describing the obsolete or legacy codes used in Uniformed Services Identification Cards, DoD Identification and Privilege Cards, and DoD/Uniformed Services Civilian Identification Cards. These data elements are no longer being included on any cards or it is expected that they will be phased out sometime in the future. They are included here because there are cards with these codes still being produced or in circulation. Tables of active data elements relevant to either or both these ID cards and the CAC are provided in Appendix C.

List of Tables

Table 31 DEERS Dependent Suffix Codes

Codes	Description
01-19	Dependent Child
20	Sponsor
30-39	Spouse of Sponsor
40-44	Mother of Sponsor
45-49	Father of Sponsor
50-54	Mother-in-law of Sponsor
55-59	Father-in-law of Sponsor
60-69	Other Dependent
98	Service Secretary Designee
This code defines the relationship of a dependent to his or her sponsor. It should be unique among the dependents of a single sponsor, and should be permanently assigned for any dependent. In some cases, these codes will be identical to those for the Family Member Prefix. Source: DEERS Data Dictionary.	

Table 32 Family Sequence Number

Codes	Description
1	First (and only, if not duplicate) Family
2, . . . , n	Sequence Number of Duplicate Family SSNs
This field is used to distinguish among sponsors who have the same SSN. The first sponsor registering the SSN in DEERS is given the Family Sequence Number of one (1). Succeeding sponsors using the same SSN are numbered sequentially from two (2). Source: DEERS Data Dictionary.	

Table 33 Pay Plan Codes

Code	Description
AD	Administratively determined not elsewhere specified
AF	American Family Members
AJ	Administrative judges, Nuclear Regulatory Commission
AL	Administrative Law judges
BB	Non supervisory negotiated pay employees
BL	Leader negotiated pay employees
BP	Printing and Lithographic negotiated pay employees
BS	Supervisory negotiated pay employees
CA	Board of contract appeals
CC	Commissioned Corps of Public Heath Service
CE	Contract education
CG	Corporate graded Federal Deposit Insurance Corp.
CP	Compensation program Office of the Comptroller of the currency
CS	Skill Based Pay demonstration employees, DLA
CU	Credit Union employees
CY	Contract education Bureau of Indian Affairs
CZ	Canal Area General Schedule type positions
DA	Demonstration administrative Director of Laboratory Programs(Navy)
DG	Demonstration general Director of Laboratory Programs(Navy)
DH	Demonstration hourly Air Force logistics command
DN	Defense Nuclear facilities safety board
DP	Demonstration professional Director of Laboratory Programs(Navy)
DS	Demonstration specialist Director of Laboratory Programs(Navy)
DT	Demonstration technician Director of Laboratory Programs(Navy)
DW	Demonstration salaried Air Force and DLA
DX	Demonstration Supervisory Air Force and DLA
EA	Administrative schedule (excluded) Tennessee Valley Authority
EB	Clerical schedule (excluded) Tennessee Valley Authority
EC	Engineering and Computing schedule (excluded) Tennessee Valley Authority

ED	Expert
EE	Expert (other)
EF	Consultant
EG	Consultant (other)
EH	Advisory committee member
EI	Advisory committee member (other)
EM	Executive schedule Office of the Comptroller of the currency
EO	FDIC executive pay
EP	Defense Intelligence Senior Executive Service
ES	Senior Executive Service (SES)
ET	General Accounting Office Senior Executive Service
EX	Executive pay
FA	Foreign Service Chiefs of Mission
FC	Foreign compensation Agency for International Development
FD	Foreign defense
FE	Senior Foreign Service
FO	Foreign Service Officers
FP	Foreign Service personnel
FZ	Consular Agent Department of State
GD	Skill based pay demonstration project managers (DLA)
GG	Grades similar to General Schedule
GH	GG employees converted to performance and management recognition system
GM	Performance Management and Recognition system
GN	Nurse at Warren G. Magnuson Clinical Center
GS	General Schedule
GW	Employment under schedule A paid at GS rate Stay-In-School program
JG	Graded tradesmen and craftsmen United States Courts
JL	Leaders of tradesmen and craftsmen United States Courts
JP	Non supervisory lithographers and printers United States Courts
JQ	Lead lithographers and printers United States Courts
JR	Supervisory lithographers and printers United States Courts

JT	Supervisors for tradesmen and craftsmen United States Courts
KA	Kleas Act Government Printing Office
KG	Non-Craft non supervisory Bureau of Engraving and Printing
KL	Non-Craft leader Bureau of Engraving and Printing
KS	Non-Craft supervisory Bureau of Engraving and Printing
LE	United States Secret Service uniformed division Treasury
LG	Liquidation graded FDIC
MA	Milk Marketing Department of Agriculture
MC	Cadet
ME	Enlisted
MO	Officer
MW	Warrant officer
NA	Non appropriated funds, non supervisory, non leader Federal Wage System
NS	Non appropriated funds, supervisory, Federal Wage System
OC	Office of the Comptroller of the Currency
PA	Attorneys and law clerks General Accounting Office
PE	Evaluator and evaluator related General Accounting Office
PG	Printing Office grades
RS	Senior Biomedical Service
SA	Administrative schedule Tennessee Valley Authority
SB	Clerical schedule (excluded) Tennessee Valley Authority
SC	Engineering and Computing schedule Tennessee Valley Authority
SD	Scientific and Programming schedule Tennessee Valley Authority
SE	Aide and Technician schedule Tennessee Valley Authority
SF	Custodial schedule Tennessee Valley Authority
SG	Public Safety schedule Tennessee Valley Authority
SH	Physicians schedule Tennessee Valley Authority
SJ	Scientific and Programming schedule (excluded) Tennessee Valley Authority
SL	Senior Level Positions
SM	Management Schedule Tennessee Valley Authority
SN	Senior Level System Nuclear Regulatory Commission

SP	Park Police Department of the Interior
SR	Statutory rates not elsewhere specified
SS	Senior Staff positions
ST	Scientific and professional
SZ	Canal Area Special category type positions
TA	Construction schedule
TB	Operating and Maintenance (power facilities) Tennessee Valley Authority
TC	Chemical Operators Tennessee Valley Authority
TD	Plant Operators schedule Tennessee Valley Authority
TE	Operating and Maintenance (nonpower facilities) Tennessee Valley Authority
TM	Federal Housing Finance board Executive level
TP	Teaching positions DoD schools only
TR	Police Forces US Mint and Bureau of Engraving and Printing
TS	Step System Federal Housing Finance board
VC	Canteen Service Department of Veterans Affairs
VG	Clerical and Administrative support Farm Credit
VH	Professional, Administrative, and Managerial Farm Credit
VM	Medical and Dental Department of Veterans Affairs
VN	Nurses Department of Veterans Affairs
VP	Clinical Podiatrists and Optometrists Department of Veterans Affairs
WA	Navigation Lock and Dam Operation and maintenance Supervisory USACE
WB	Wage positions under Federal Wage System otherwise not designated
WD	Production facilitating non supervisory Federal Wage System
WE	Currency manufacturing Department of the Treasury
WG	Non supervisory pay schedule Federal Wage System
WJ	Hopper Dredge Schedule Supervisory Federal Wage System Dept of Army
WK	Hopper Dredge Schedule non supervisory Federal Wage System Dept of Army
WL	Leader pay schedules Federal Wage System
WM	Maritime pay schedules
WN	Production facilitating supervisory Federal Wage System
WO	Navigation Lock and Dam Operation and maintenance leader USACE

WQ	Aircraft Electronic Equipment and Optical Inst. repair supervisory
WR	Aircraft Electronic Equipment and Optical Inst. repair leader
WS	Supervisor Federal Wage System
WT	Apprentices and Shop trainees Federal Wage System
WU	Aircraft Electronic Equipment and Optical Inst. repair non supervisory
WW	Wage type excepted Stay-In-School Federal Wage System
WY	Navigation Lock and Dam Operation and maintenance non supervisory USACE
WZ	Canal Area Wage System type positions
XA	Special Overlap Area Rate Schedule non supervisory Dept of the Interior
XB	Special Overlap Area Rate Schedule leader Dept of the Interior
XC	Special Overlap Area Rate Schedule supervisory Dept of the Interior
XD	Non supervisory production facilitating special schedule printing employees
XF	Floating Plant Schedule non supervisory Dept of Army
XG	Floating Plant Schedule leader Dept of Army
XH	Floating Plant Schedule supervisory Dept of Army
XL	Leader special schedule printing employees
XN	Supervisory production facilitating special schedule printing employees
XP	Non supervisory special schedule printing employees
XS	Supervisory special schedule printing employees
YV	Temporary summer aid employment
YW	Student aid employment Stay-In-School
ZA	Administrative National Institute of Standards and Technology
ZP	Scientific and Engineering Professional National Institute of Standards and Technology
ZS	Administrative Support National Institute of Standards and Technology
ZT	Scientific and Engineering Technician National Institute of Standards and Technology
ZZ	Not applicable (use only with pay basis without compensation when others N/A)